FOREST PEST CONDITIONS IN CALIFORNIA-1972

A PUBLICATION OF
THE CALIFORNIA FOREST PEST CONTROL ACTION COUNCIL

THE CALIFORNIA FOREST PEST CONTROL ACTION COUNCIL was founded in 1951. Its membership is open to private and public forest managers, foresters, entomologists, pathologists, zoologists, and others interested in the protection of forests from damage caused by animals, insects, and diseases. Its objective is to establish, maintain, and improve, communication among groups and individuals -- managers, administrators, researchers -- who are concerned with these problems. This objective is accomplished by:

1. Coordination of detection reporting and compilation of pest damage information.

2. Evaluation of pest conditions.

3. Pest control recommendations made to forest managing agencies and owners.

4. Review of policy, legal and research aspects of forest pest control and submission of recommendations thereon to appropriate authorities.

The State Board of Forestry recognizes the Council as an advisory body with respect to pest protection matters. The Council is also a participating member of the Western Forest Pest Committee of the Western Forestry Conservation Association.

THE COVER PHOTO: Phoradendron bolleanum subspecies pauciflorum, a leafy mistletoe on white fir. The mistletoe is disseminated by members of the thrush family including the western bluebird, the robin and Townsend's solitaire. The mistletoe causes extensive branch dieback and heavily infected trees are preferentially attacked by the fir engraver beetle, Scolytus ventralis.

Sacramento

January 1973

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THIS REPORT, FOREST PEST CONDITIONS IN CALIFORNIA - 1972 is compiled for public and private forest land managers to keep them informed of pest conditions on forested land in California, and as a historical record of pest trends and occurrences. The report is based largely on information provided by the Statewide Cooperative Forest Pest Detection Survey. In 1972, 298 reports were received: 200 for insects, 81 for diseases, and 17 for animal damage.

The report was prepared by the Forest Service and the Bureau of Sport Fisheries and Wildlife in cooperation with the Council members. It was printed and distributed by the California Division of Forestry.

THE COOPERATIVE FOREST PEST DETECTION SURVEY is sponsored by the California Forest Pest Control Action Council. Detection of damage due to insects, diseases, animals, weather, chemical or air pollution should be reported on the Forest Pest Detection Report, form R5-5200-33, or by card or letter. Forms are available through the U.S. Forest Service and the California Division of Forestry. (Form facsimiles are found in the back of this publication.) Detection reports should be sent to:

U.S.D.A. Forest Service
Division of Timber Management
630 Sansome Street
San Francisco, California 94111

All detection reports will be acknowledged and evaluated by specialists concerned with damage caused by forest pests.

When requesting identification of an unknown causal agent, send specimens of pests and/or pest damage to the address listed above. Specimens should be submitted in mailing tubes with screw caps. (Mailing tubes will be furnished upon request.) Samples too large for a tube should be enclosed in a polyethylene bag and packaged for shipment. Disease specimens should be collected and submitted immediately while the medium (wood, etc.) is fresh as it is impossible to culture out the causal fungus after the specimen has dried or been invaded by secondary organisms.

YOUR COOPERATION WITH THE CALIFORNIA FOREST PEST CONTROL ACTION COUNCIL IN ASSISTING WITH THE COOPERATIVE FOREST PEST DETECTION SURVEY IS GREATLY NEEDED AND APPRECIATED.

HIGHLIGHTS OF PEST CONDITIONS - 1972

STATUS OF INSECT PESTS. Forest insect pest activity increased in 1972 but generally remained at a moderate level. Damaging infestations of some defoliators, such as the Douglas-fir tussock moth, sawflies and needle miners, continued in several areas. A notable spreading and intensification of scale damage to sugar pine took place.

Bark beetle depredations increased, but for the most part remained localized and scattered, despite well below average rainfall this year throughout most of California. The reported high incidence of lightning-struck trees, east of the Sierra Nevada Mountains, portends increased opportunity for successful bark beetle attacks in 1973.

STATUS OF DISEASE PESTS. A new infection center of Verticicladiella wagenerii was found east of Gasquet in Del Norte County. V. wagenerii was attacking western white, sugar and knobcone pine. This is the first report of V. wagenerii infecting these species.

Ozone damage on Jeffrey pine was detected for the first time at San Emigdio Mountain, Kern County. This is the first report of heavy air pollution damage in the San Joaquin air basin.

Weather conditions throughout California were generally very dry. There were many reports of plant damage due to drought, and there was a noticeable reduction of foliage diseases throughout the State.

STATUS OF ANIMAL PESTS. Porcupines, deer and pocket gophers are the three major pests in the forest animal damage picture. Porcupine damage for the second consecutive year exceeded that normally recorded for deer. Damage caused by these three species has ranged from moderate to heavy across the State. Damage is increasing in those areas where control measures are not undertaken.

STATUS AND CONTROL OF INSECT PESTS

WESTERN PINE BEETLE, Dendroctonus brevicomis. The McCloud Flats, Siskiyou County, infestation of the western pine beetle in young ponderosa pine stands, first reported as a serious problem in 1967, continued during 1972. Suppression of the epidemic by salvage logging of infested trees was attempted with some success in 1968 and 1969. Field testing of synthetic pheromones (attractants) for western pine beetle control was started in 1971 and continued in 1972. Pending the analysis of existing data, this testing may be continued in 1973. In 1972, commercial thinning and harvest timber sales were initiated to improve tree composition and density of the pine stands in the area. This management program is expected to reduce tree susceptibility to bark beetle attacks and thereby reduce tree killing to a normal level.

During 1972, a western pine beetle epidemic developed in ponderosa pine around the Red Mountain burn of 1970 in Kern County. Attempts to avoid this outbreak, by salvaging dead and dying trees after the fire, fell short of the objective because of various restraints on logging. Now, due to recent developments in helicopter logging, it may be possible to remove most of the infested trees by air, and an aerial salvage logging sale will be offered during the winter season in an attempt to suppress the outbreak.

Helicopter salvage of bark beetle-infested and fire-damaged timber on the San Bernardino National Forest.

Numerous other spots of tree killing by the western pine beetle were reported in northern California; most prevalently on the Mendocino National Forest in parts of Colusa, Lake, Glenn and Trinity Counties, and on the Lassen National Forest in Shasta and Lassen Counties. In southern California, the western pine beetle continued killing ponderosa and

Coulter pine trees around Lake Arrowhead, San Bernardino County. Serious air pollution injury, urbanization, and drought damage are the major reasons for this continuing infestation.

MOUNTAIN PINE BEETLE, Dendroctonus ponderosae. Tree killing by the mountain pine beetle has been conspicuous in the recreation forests around Lake Tahoe. Here, dense lodgepole pine stands, further weakened by side-effects of urbanization, suffer from increasing beetle attacks and tree mortality. In southern California recreation forests, the mountain pine beetle continues to attack smog-damaged ponderosa pine trees around Lake Arrowhead in San Bernardino County.

The mountain pine beetle also continues to attack and kill sugar pine and lodgepole pine in several other areas of northern California. Near Butt Lake in Plumas County, many venerable sugar pines were killed by this beetle during the summer of 1972 in mixed stands also infested by the Douglas-fir beetle (see below).

Increased lodgepole pine mortality has been detected at Granite Creek, Madera County; Tamarack Flats, Siskiyou County; and in several spots east of Lassen Volcanic National Park, Lassen County as well as chronic tree mortality in parts of Yosemite National Park.

DOUGLAS-FIR BEETLE, Dendroctonus pseudotsugae. Between one and two hundred large Douglas-fir trees have been invaded by Douglas-fir beetles near Butt Lake. The infestation is believed to have originated from trees that were felled by storms during the winter of 1970 and subsequently provided host material to increase the beetle population in 1971. Since the infestation is readily accessible for logging, chances for removing the infested Douglas-fir and associated infested sugar pine appear good and plans for salvage are underway.

JEFFREY PINE BEETLE, Dendroctonus jeffreyi. This beetle intensified the infestation of high risk Jeffrey pine trees around Big Bear Lake, San Bernardino County. The tree mortality has more than doubled since 1971, and is the highest in the past five years. The first helicopter salvage logging operation in California was successful in harvesting mature and fire-damaged Jeffrey pine on the Bear Burn immediately west of the Lake.

CALIFORNIA FLATHEADED BORER, Melanophila californica. The California flatheaded borer persists in causing high Jeffrey pine mortality at Garner Valley, Riverside County and in the Laguna Mountains, San Diego County. Severe drought conditions prevailed and at Garner Valley all water use was curtailed except for essential purposes. In the Laguna Mountains, Jeffrey pine losses were the highest on record.

PINE ENGRAVER BEETLES, Ips spp. A long spring and summer drought, with periods of excessively high temperatures in July and August predisposed pine stands to engraver beetle damage. Localized outbreaks developed in numerous pine areas. The beetles commonly responsible were

Ips paraconfusus or I. pini. In most problem areas, the adverse weather conditions were aggravated by logging and thinning disturbance or severe site conditions.

Some representative areas were: Rattlesnake Meadows on the Kern Plateau where increased killing of Jeffrey pine occurred in a thinning and dwarf mistletoe control project; Spring Gulch, Trinity County, where tree killing in a hybrid (Monterey x knobcone) plantation followed late fall thinning; Dow Butte, Lassen County, where several outbreaks developed in ponderosa pine areas logged in 1971 or thinned in the summer of 1972; Ladder Butte, Lassen County, where tree killing developed in Jeffrey pine on generally poor, lava cap-type sites; Fort Hill, Glenn County, where tree killing followed logging; and the Crestview Burn, Mono County, where many Jeffrey pine trees damaged in a fire of July 1972 were attacked later in the summer.

Large patch killing of knobcone pine, reported from areas of the Shasta-Trinity and Sierra National Forests, are also believed to be epicenters of pine engraver beetle activity. Numerous additional spots of suspected pine engraver beetle damage were seen during aerial flights.

No chemical control efforts specifically for pine engravers were reported during the year. Indication of a trend towards increased precipitation and improved tree growing conditions suggest that no direct control will be needed in the immediate future.

FIR ENGRAVER BEETLE, Scolytus ventralis. Fir engraver beetles continued killing groups of true fir trees in northern California, but tree mortality apparently declined from the 1971 level. The most notable areas in 1972 were Shields Creek, Modoc County, and scattered locations around Mt. Shasta. At Deer Creek in El Dorado County, an infestation of fir engraver and twig beetles primarily caused top killing of trees weakened by the unusually heavy cone crop in 1971.

DOUGLAS-FIR TUSSOCK MOTH, Hemerocampa pseudotsugata. The severe outbreaks of the Douglas-fir tussock moth, reported in 1971 have subsided and other threatening infestations, detected at that time, failed to develop into damaging outbreaks. However, in 1972, the pest remained active over much of the white fir belt of the Sierra Nevada range where nine new areas of obvious defoliation developed in scattered locations of the Eldorado, Stanislaus and Sierra National Forests: Chinaman Creek, North Fork of Skull Creek, Jawbone Pass and Upper Dodge Ridge in Tuolumne County; Summit Level Ridge, Calaveras County; Lumberyard and Plummer Ridge, El Dorado and Amador Counties; and Raymond Mountain and Speckerman Mountain, Madera County. Most of these spots are 100 to 300 acres in size except one (Lumberyard) that approaches 2,000 acres.

Preliminary evaluations indicate a threatening tussock moth population still resident in only two or three of these areas but all known locations have not yet been checked due to access difficulties. Next summer, surveys of the early larval stages of development will be made to determine tussock moth population levels in known and suspected infestations.

Insecticide tests, conducted in the State of Washington, and further work on microbial sprays still have not provided conclusive results for direct control recommendations.

WHITE FIR SAWFLY, Neodiprion abietis. For the third or fourth year, the white fir sawfly caused increased damage during 1972. Defoliation, severe enough to be readily visible from the air, occurred in sizable areas. On the Plumas National Forest, three infestations -- at Grizzly Ridge, Nelson Creek and Snoring Springs, Plumas County -- covered approximately 20 square miles. Smaller outbreaks were apparent at Soda Ridge, Plumas County; Deadman Peak, Sierra County; Knox Mountain, Modoc County; and Worley Mountain, Lassen County.

Evaluations of some of the Plumas County outbreaks detected sufficient virus infections and parasitisms in the sawfly population to suggest that the epidemic had reached its zenith and would decline in 1973.

Two simple innovations, a flip-up stereoscope headset and translucent light board, have made possible the effective field use of large format aerial color transparencies for checking forest pest activities.

NEEDLE MINERS. An increase in the defoliation of various pine species by needle miners was evident in 1972. Surveys conducted during the summer in Yosemite National Park showed that the lodgepole needle miner, Coleotechnites milleri, maintains a large and increasing population in the Tuolumne Meadows outbreak. Some additional areas of damage were also detected. Severe defoliation has already taken place in some "backcountry" locations and serious defoliation is expected in 1973 in some of the high-use recreation areas, particularly around Tenaya Lake.

Another needle miner (Coleotechnites sp.) on Jeffrey pine was detected for the first time on about 2,000 acres at Big Bear Lake, San Bernardino County. This pest had previously been confined in a chronic infestation west of Big Bear at Snow Valley where it had subsided in 1971, but then increased again on 200 acres in 1972.

An unidentified needle miner also defoliated knobcone pine at two locations in northern California, near Mt. Shasta.

SCALE INSECTS. A spreading infestation of the black pine leaf scale, Nuculaspis californica is causing severe loss of foliage on sugar pine trees in a broad, mid-elevation belt from about Stirling City, Butte County to Mt. Shasta in Siskiyou County. This pest has also been reported in ponderosa pine at Soldier Mountain, Shasta County, and on Jeffrey pine at Rocky Pass, San Diego County.

An evaluation of the infestation on sugar pine near Mt. Shasta, where the problem has persisted for at least two years, indicates the outbreak will continue next year. While little or no tree mortality has yet resulted from the damage, the problem warrants additional study if it persists as expected.

There are indications that the large, persistent infestation of the pinyon needle scale, Matsucoccus acalyptus, is declining in Ventura and Kern Counties. In Tulare County, a small but severe infestation of the pinyon needle scale threatened trees in Kennedy Meadows Campground and about 900 trees were protected in the campground with one application of a 0.5 percent dimethoate spray. Research on the biology and natural enemies of this scale is continuing at the University of California at Riverside.

INSECTS DAMAGING PLANTATIONS AND YOUNG TREES. The continuing problem of the fir coneworm, Dioryctria abietella, attacking valuable grafts in seed orchard trees reached catastrophic proportions in 1972 when approximately 50 percent of all new unprotected ponderosa pine grafts in Forest Service orchards were infested. However, field tests indicate that lindane sprays are highly effective in preventing this damage and the process to register lindane for this use will be initiated in the near future.

The orange tortrix, Argyrotaenia citrana, was discovered severely defoliating 2-year-old Douglas-fir seedlings at the Forest Service Humboldt Nursery in Humboldt County. A small test application of Zectran emulsion spray provided a moderate level (65 percent) of control for this pest.

Other pests causing some increased damage in plantations and young trees during the year were the pine needle sheath miner, Zelleria haimbachi, and the pine reproduction weevil, Cylindrocopturus eatoni. The widespread infestation of the pine resin midge, Cecidomyia piniinopis, continued to decline but caused some damage in localized areas.

The western pine tip moth, Rhyacionia bushnelli, which was discovered in San Diego County for the first time in 1971, continues to spread in Christmas tree plantations. It has not yet been detected in native stands.

HARDWOOD DEFOLIATORS. Infestations of the California tortoise-shell butterfly, Nymphalis californica, were much reduced from the 1971 high population levels. The satin moth, Stilpnotia salicis, continued to defoliate cottonwood trees northeast of Alturas in Modoc County.

TABLE I

INSECT CONTROL ACTION RECOMMENDED BY THE COUNCIL - 1972

NORTHERN CALIFORNIA COMMERCIAL AND RECREATIONAL FORESTS

INFESTATION AREA	ESTIMATED ACREAGE	COUNTY	INSECT	HOST	RECOMMENDED ACTION
BARK BEETLES					
Basket Pass	1,000	Kern	Db	PP	Salvage
Butt Lake	1,000	Plumas	Dp,Dm	DF,SP	Salvage
Crestview	800	Mono	Ips	JP	Salvage and surveillance
McCloud Flats	7,000	Siskiyou	Db	PP	Salvage, thin and research
Mt. Shasta	Unknown	Siskiyou	Sv	WF	Evaluate
Shields Creek	10,000	Modoc	Sv	WF	Evaluate
South Lake Tahoe	150	El Dorado	Dm	LP	Salvage, thin and surveillance
DEFOLIATORS					
Dodge Ridge	100	Tuolumne	Hp	WF	Evaluate and surveillance
Jawbone Pass	300	Tuolumne	Hp	WF	Evaluate and surveillance
Lumberyard	1,800	El Dorado & Amador	Hp	WF	Evaluate and surveillance
Northern California	Unknown	Northern California	Na	WF	Surveillance
Northern California	Unknown	Siskiyou, Shasta, Tehama & Butte	Nc	SP	Evaluate and surveillance
Plummer Ridge	300	El Dorado	Hp	WF	Evaluate and surveillance
Raymond Mtn.	100	Madera	Hp	WF	Evaluate and surveillance
Sentinel, Crooked and Wet Meadows	2,200	Mono	Cm	LP	Surveillance and research
Skull Creek	300	Tuolumne	Hp	WF	Evaluate and surveillance
Speckerman Mtn.	100	Madera	Hp	WF	Evaluate and surveillance
Summit Level Ridge	100	Calaveras	HP	WF	Evaluate and surveillance
Upper Chinaman Creek	100	Tuolumne	HP	WF	Evaluate and surveillance

PLANTATIONS AND EXPERIMENTAL AREAS

East Side Plantation	Unknown	Northern California	Eu	PP	Survey and research
Established Seed Orchards	100	Northern California	Da,Rz,Zh	PP	Spray grafted trees five times a year
Plantations		Statewide	Rb,Cp	Hard pines	Surveillance and research
Seed Production Areas		Northern California	C&S	PP	Surveillance and research

STATE AND NATIONAL PARKS

Anza Borrego State Park	500	San Diego	Db,Mc	CP	Maintenance control*
Cuyamaca Rancho State Park	8,000	San Diego	Mc,Db	JP,PP	Surveillance
Heart Bar State Park	1,300	San Bernardino	Dj	JP	Surveillance
Palomar State Park	1,500	San Diego	Db,Ips,Sv,Mc	CP,PP,WF	Surveillance
San Jacinto State Park	11,000	Riverside	Mc,Db	JP,CP,PP	Maintenance control*
Lassen Volcanic National Park	3,000	Shasta & Lassen	Dj,Db,Dm	JP,PP,SP,LP	Surveillance
Sequoia and Kings Canyon Natl. Park	8,500	Fresno	Db,Dm	PP,SP	Maintenance control*
Sequoia and Kings Canyon Natl. Park	400	Tulare	Cm	LP	Surveillance
Yosemite National Park	57,700	Mariposa & Tuolumne	Db,Dm,Dj	PP,SP,JP,LP	Maintenance control*
Yosemite National Park	100,000	Tuolumne	Cm	LP	Surveillance and research

SOUTHERN CALIFORNIA RECREATION FORESTS

Arrowhead-Crestline	47,000	San Bernardino	Dm,Db,Ips,Dj	PP,CP,JP	Sanitation and maintenance control*
Arroyo-Seco District	3,000	Los Angeles	Db,Ips,Mc	PP,CP,JP	Sanitation and maintenance control*
Big Bear Valley	8,800	San Bernardino	Dj,Ips,Mc,Sv	JP,WF	Sanitation and maintenance control*
Corte Madera	1,600	San Diego	Db,Ips,Mc,Dv	CP,JP,PP	Surveillance
Idyllwild-San Jacinto	37,000	Riverside	Mc,Db,Ips,Dm	PP,CP,JP	Sanitation and maintenance control*
Julian-Pine Hills	12,000	San Diego	Db,Ips	CP	Surveillance
Laguna Mtn.	9,700	San Diego	Db,Mc	CP,JP	Maintenance control*
Lost Valley	4,000	San Diego	Db,Ips	CP	Maintenance control*
Mt. Baldy District	1,500	Los Angeles	Ips,Dj,Dm,Mc,Db	PP,JP,CP	Sanitation and maintenance control*
Mt. Pinos District	24,000	Ventura	Ma	Pe	Surveillance
Mt. Pinos District	7,900	Ventura & Kern	Mc,Ips	JP	Sanitation and maintenance control*
Ranger Peak-Figueroa Mtn.	700	Santa Barbara	Db,Ips,Dv	PP,CP	Maintenance control*
San Gorgonio District	25,000	San Bernardino	Db,Dj,Ips	PP,JP,CP	Sanitation and maintenance control*
Snow Valley-Big Bear	2,200	San Bernardino	C sp.	JP	Surveillance and research
Valyermo District	14,600	Los Angeles	Mc,Ips	JP	Sanitation and maintenance control*
Wrightwood	2,000	San Bernardino	Mc,Ips	JP	Maintenance control*

ABBREVIATIONS

INSECTS

C sp. - Jeffrey pine needle miner
Cm - Lodgepole needle miner
Cp - Pine resin midge
C&S - Cone and seed insects
Da - Fir coneworm
Db - Western pine beetle
Dj - Jeffrey pine beetle
Dm - Mountain pine beetle
Dp - Douglas-fir beetle
Eu - Eucosma
Hp - Douglas-fir tussock moth
Ips - Pine ips
Ma - Pinyon needle scale
Mc - California flatheader borer
Na - White-fir sawfly
NC - Black pineleaf scale
Rb - Western pine tip moth
Rz - Ponderosa pine tip moth
Sv - Fir engraver
Zh - Needle-sheath miner

HOST

CP - Coulter pine
DF - Douglas-fir
JP - Jeffrey pine
LP - Lodgepole pine
Pe - Pinyon pine
PP - Ponderosa pine
RF - Red fir
SP - Sugar pine
WF - White fir

* Maintenance control is defined as suppression measures applied continually or annually (seasonally) in an effort to keep tree losses at a tolerable level. Suppression measures may include logging, wood cutting, felling and burning or insecticide application on infested trees. Based on the Council's 1971 resolution it is recommended that chemicals be used only when non-insecticidal alternatives of suppression are not suitable.

STATUS AND CONTROL OF DISEASES

SIGNIFICANT CONDITIONS

BLACK STAINING ROOT DISEASE, Verticicladiella wagenerii. A new infection center of Verticicladiella wagenerii was found adjacent to the Ranger Lewis Summer Home Tract, two miles east of Gasquet in Del Norte County. The infection center was approximately 60 acres in size and the disease is continuing to spread. The fungus is infecting western white, sugar, and knobcone pines. This is the first report of V. wagenerii infecting any of these tree species. New infection centers on Douglas-fir were found in Mendocino, Alpine and Tuolumne Counties in California, and in that part of Jackson County, Oregon, which is within the boundaries of the Klamath National Forest.

In southern California, V. wagenerii is continuing to kill pinyon pine in San Bernardino County, but this infestation has not changed significantly since the report last year.

ELYTRODERMA NEEDLE DISEASE OF PONDEROSA AND JEFFREY PINES. The 1971 outbreak of elytroderma around Baldwin Beach, South Lake Tahoe, was severe again in 1972. Disease impact plots established in 1971 showed the following results: of 609 trees on six plots, 278 were rated as heavily infected. Fifteen months later, 41, or 7 percent, of the plot trees were dead. All but two of the dead trees were heavily infected trees. Of the dead trees, 70 percent were below 10 inches d.b.h. and 30 percent were 11-28 inches d.b.h. Radial growth of surviving heavily infected trees was half that of healthy, lightly and moderately infected trees in 1971 and 1972. Mortality appears to be not only from elytroderma per se, but also the result of bark beetles attacking trees weakened by elytroderma.

PHLOEM NECROSIS OF DOUGLAS-FIR, Dermea pseudotsugae. New infection centers of Dermea pseudotsugae were found in Del Norte, Siskiyou and Trinity Counties. The fungus is causing the greatest amount of damage on the Happy Camp Ranger District, Siskiyou County, where the disease was first discovered in 1970 on the little Douglas plantation. D. pseudotsugae is continuing to spread throughout the Douglas-fir in this plantation and could potentially eliminate the Douglas-fir component of the plantation. Some naturals in the area are also infected, but the trees are scattered and the damage is of little economic significance.

RED BAND NEEDLE BLIGHT, Scirrhia pini (Dothistroma pini). This disease appeared relatively inactive in plantations infected in past years. However, the disease potential has not been reduced and where a susceptible host and favorable environmental conditions are present, the fungus is still quite active. On the Westbrook Ranch in Del Norte County, and on Simpson Lumber Company land in Humboldt County, where there have been recent plantings of bishop and Monterey pine, the fungus caused severe defoliation and many trees were killed.

NURSERY DISEASES. Botrytis cinerea caused severe losses in parts of two nursery beds of 6-month old giant sequoia (Sequoiadendron giganteum) seedlings at the Forest Service Nursery near Placerville in El Dorado County. Because of the severity of the problem in the field, and the possibility of continued infection during seedling storage and shipment, a series of fungicide control tests were conducted by the Pacific Southwest Forest and Range Experiment Station, University of California Agriculture Extension Service, and the Regional Office of the Forest Service. In the trials conducted, Benlate was the only field-applied fungicide that gave adequate control.

At the Humboldt Nursery there were small outbreaks of Phoma spp. on Douglas-fir, and Sirococcus strobilinus on Jeffrey pine, but a continuing spray program using Difolatan kept these fungi in check.

SMOG DAMAGE. Smog damage continues at the same high level in the San Bernardino and Angeles National Forests. The rate of mortality in the Jeffrey and ponderosa pine has increased to four percent per year, and there is evidence that oxidant air pollution is having a greater impact on associated conifers and hardwoods.

Damage to Jeffrey pine was detected for the first time at San Emigdio Mountain, Kern County, and to ponderosa pine on Figueroa Mountain, Santa Barbara County. The damage on San Emigdio Mountain is the first report of heavy damage in the San Joaquin air basin.

Cooperative studies are underway to measure trend and to determine the impact of ozone damage on a mixed-conifer ecosystem.

CONDITIONS IN GENERAL

Rainfall was well below average this year throughout most of California. Only the north coast had average or above average precipitation. Consequently, there were many reports of plant damage due to drought and in portions of the Southern Sierra Nevada Mountain range there was some defoliation of the oaks due to reduced soil moisture. There was also a noticeable reduction in reports of foliage diseases throughout the State.

Unknown cankers were found on two hosts. These cankers were found on young ponderosa pine in El Dorado, Madera and Amador Counties, and on young Douglas-fir in Trinity County. At the present time, work is being conducted by pathologists at the Regional Office of the Forest Service to identify these fungi.

SURVEYS

FOREST PEST INVENTORY. The Forest Service is beginning an inventory of forest pest incidence in California. The inventory employs remote

sensing, field survey, and data analysis procedures. The data derived from the pest inventory will be used: (1) to determine the impact of forest insects and diseases separately, or in combination, (2) to identify high-hazard sites or the problem stands; and (3) to suggest management procedures which will reduce pest loss.

During the past field season, a 13,000-acre portion of the Stanislaus National Forest was inventoried for pest impact. The data derived from this inventory are currently being analysed. In 1973, a larger area is planned for inventory. This will begin a long-term inventory of the forests of the Region.

FOMES ANNOSUS IN YOSEMITE VALLEY. A Fomes annosus survey of Yosemite Valley was completed in 1971. One hundred disease centers were found in 24 developed sites. Forty-four additional centers were found outside developed sites. Eighty-eight centers, encompassing six acres, were mapped in developed sites, and permanent plots were established for future observations.

Dead trees in the mapped centers included 506 ponderosa pines (mean d.b.h. 23.5"), 99 incense-cedars (mean d.b.h. 13.7"), 8 white firs (mean d.b.h. 18.0"), and 2 lodgepole pines (each 14" d.b.h.).

EVALUATION OF FOMES ANNOSUS IN COMMERCIAL STANDS. An evaluation to estimate the biological effects and damage potential of Fomes annosus to tree species within different forest types in California was begun this summer. Ground information was collected on F. annosus infection centers occurring in the eastside pine forest type within the Modoc, Lassen and Plumas National Forests.

Techniques have been developed to computer map the infection centers, and the data are now in the process of being analysed.

RED FIR DWARF MISTLETOE SURVEY. The survey to determine the impact of dwarf mistletoe Arceuthobium abietinum f. sp. magnificae) in red fir forests in California was continued during the summer of 1972 to include the Klamath National Forest. The preliminary analysis indicates that the results will be similar to the results obtained in 1971.

The collection of data from the temporary plots has been completed and the preliminary analysis indicates that the results will be similar to the results obtained in 1971. In addition, five permanent plots have been established on various National Forests. These permanent plots will be used to follow the changes in the impact of dwarf mistletoe on red fir over extended time periods.

VERTICICLADIELLA WAGENERII EVALUATION. Preliminary work on Blodgett Experimental Forest (UCB), in El Dorado County and elsewhere suggests strongly that root disease caused by Verticicladiella wagenerii plays an important role in the outbreaks of western pine beetles, and that the combined effects of the two pests should be considered in evaluating the impact of that insect.

A field method that uses remote sensing to detect infestations of the fungus and the beetle was developed in 1971 by pathologists and entomologists from the Regional Office of the Forest Service, the Pacific Southwest Forest and Range Experimental Station and the University of California. The first phase of a survey of about 25,000 acres on the Blodgett Experimental Forest and adjacent Eldorado National Forest lands will be largely completed by the end of 1972.

The survey data will be used: (1) to evaluate the usefulness of aerial photography in the detection and evaluation of V. wagenerii and bark beetle infestations in ponderosa pine, (2) to determine the stand and site factors associated with past occurrence, (3) to determine the impact of the disease and bark beetles on the forest resource, and (4) to determine the relative importance of V. wagenerii in predisposing pines to bark beetle-caused mortality.

BLISTER RUST EVALUATION. Data collected from a survey made on the Plumas National Forest in 1971 suggested that the life expectancy of young-growth sugar pines infected with white pine blister rust may be much greater than was earlier assumed. Further data were collected on the Lassen National Forest in 1972. The data are currently being analysed and an impact model for blister rust on young sugar pines will be developed from the data. The evaluation was planned and initiated as a cooperative project by the Forest Service and the University of California.

NEW DISEASES AND HOSTS

Black staining root disease (Verticicladiella wagenerii) was found infecting western white, sugar and knobcone pine two miles east of Gasquet in Del Norte County. This is the first report of V. wagenerii infecting these tree species.

Canker stain (Ceratocystis fimbriata Ell. Folst f. platani (Walter), a serious and infectious disease of sycamore or plane tree was found in the city of Modesto, Stanislaus County. This is the only known occurrence of the disease in California.

TABLE II

FOREST DISEASES REPORTED - 1972

CAUSAL AGENT	HOST	COUNTY
RUSTS		
Coleosporium sp.	Pe	San Bernardino
Cronartium coleosporiodes	LP	Placer
Peridermium filamentosum	JP	Ventura
Peridermium harknessii	PP	Amador
	PP	Siskiyou
FOLIAGE DISEASES		
Davisomycella medusa	PP	Humboldt
Dothistroma pini	BP	Humboldt
Elytroderma deformans	JP	Fresno
Lirula abietis-concoloris	WF	Plumas (2)*
	WF	Shasta
Lophodermium sp.	PP	Siskiyou
Venturia tremulae	QA	Fresno
Virgella robusta	WF	Plumas
	WF	Shasta
MISTLETOES		
Dwarf Mistletoe	CP	Monterey
	DF	Plumas
	DF	Tehama (2)*
	RF	Nevada
	WF	Nevada
HEART ROTS		
Echinodontium tinctorium	DF	Del Norte
	WF	Lassen
Fomes pini	DF	Butte
	DF	Siskiyou
ROOT DISEASES		
Armillaria mellea	ES	Del Norte
	DF	Mendocino (2)*
	PP	Shasta
	PP	Siskiyou
	PP	Tehama
Fomes annosus	CRw	Del Norte
	SP	El Dorado
	IC	Fresno
	PP	Fresno
	SP	Fresno
	JP	San Bernardino
	DF	Siskiyou (2)*
	PP	Siskiyou
	PP	Trinity
	JP	Ventura (2)*
Polyporus schweinitzii	PP	Siskiyou
Verticicladiella wageneriі	DF	Mendocino (5)*
	JP	Placer
	KP	Del Norte
	SP	Del Norte
	WW	Del Norte
NURSERY DISEASES		
Botrytis sp.	CP	San Diego
	Rw	San Diego
	Rw	Humboldt

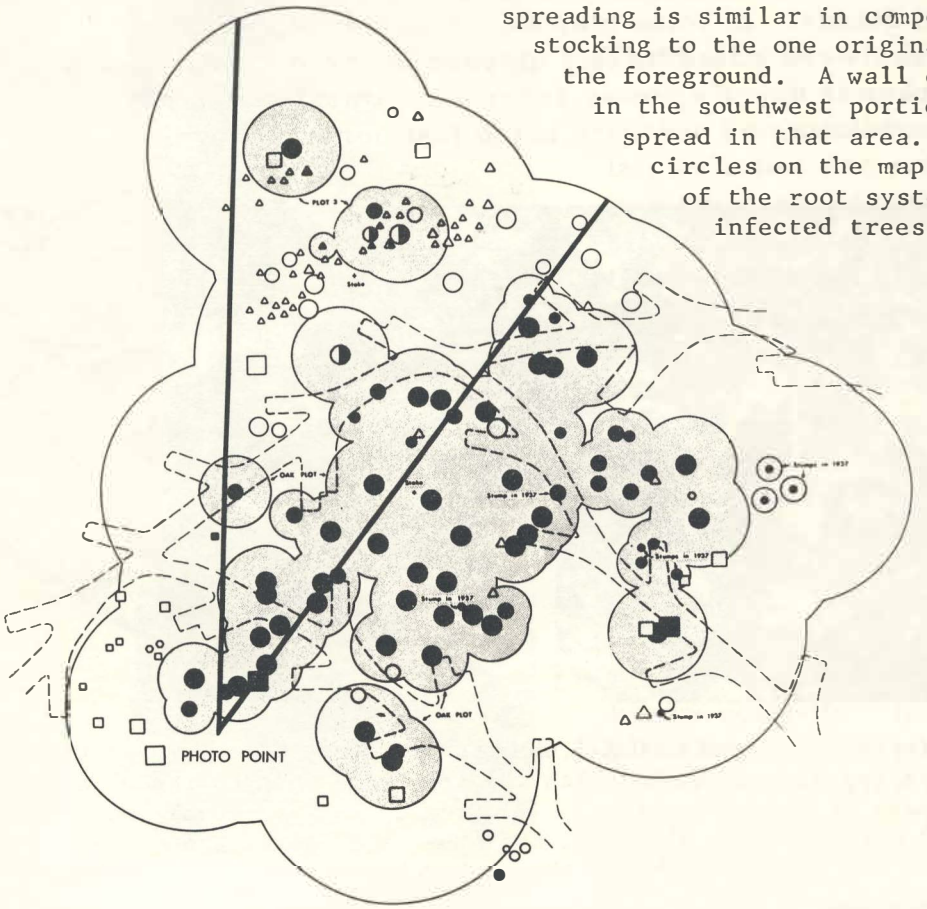
CAUSAL AGENT	HOST	COUNTY
CANKER & STEM DISEASES		
Cytospora abietis	RF	El Dorado
	RF	Nevada
	WF	El Dorado
	WF	Nevada
Dermea pseudotsugae	DF	Humboldt
	DF	Jackson (Ore.)
	DF	Siskiyou (6)*
Redwood Gall	Rw	Humboldt
Unknown Canker	PP	El Dorado
	PP	Madera
	PP	Amador
MISCELLANEOUS		
Blue Broom	SP	Trinity
Drought	PP	Fresno
	SP	Fresno
	DF	Mariposa
	IC	Riverside
	PP	Nevada
	PP	Siskiyou
Frost	JP	Mono
Heat	WF	Amador
	DF	Trinity
	RF	Tuolumne
Salt	PP	Siskiyou
Winter Injury	PP	Fresno
	PP	Mendocino
	SP	Mendocino
	JP	Shasta
	PP	Shasta
	SP	Shasta
	PP	Siskiyou (2)*

HOST ABBREVIATIONS

BP - Bishop pine	Pe - Pinyon pine
CP - Coulter pine	PP - Ponderosa pine
CRw - Coast Redwood	QA - Quaking aspen
DF - Douglas-fir	RF - Red fir
ES - Engelmann spruce	Rw - Redwood
IC - Incense cedar	SP - Sugar pine
JP - Jeffrey pine	WF - White fir
LP - Lodgepole pine	

* Number of reports received.

Fomes annosus created this opening in a Yosemite Valley campground in roughly 40 years. (A map made in 1937 shows all of the trees that were alive at the time.) Plant pathologists estimate that the center is extending into surrounding trees at the rate of four feet a year, and that most of the vulnerable trees within the outer circle will be dead within ten years. The stand into which the disease is spreading is similar in composition and stocking to the one originally occupying the foreground. A wall of oaks (squares) in the southwest portion has halted the spread in that area. The inner shaded circles on the map indicate the extent of the root systems of dead or infected trees.



KNOW YOUR FOREST DISEASES*

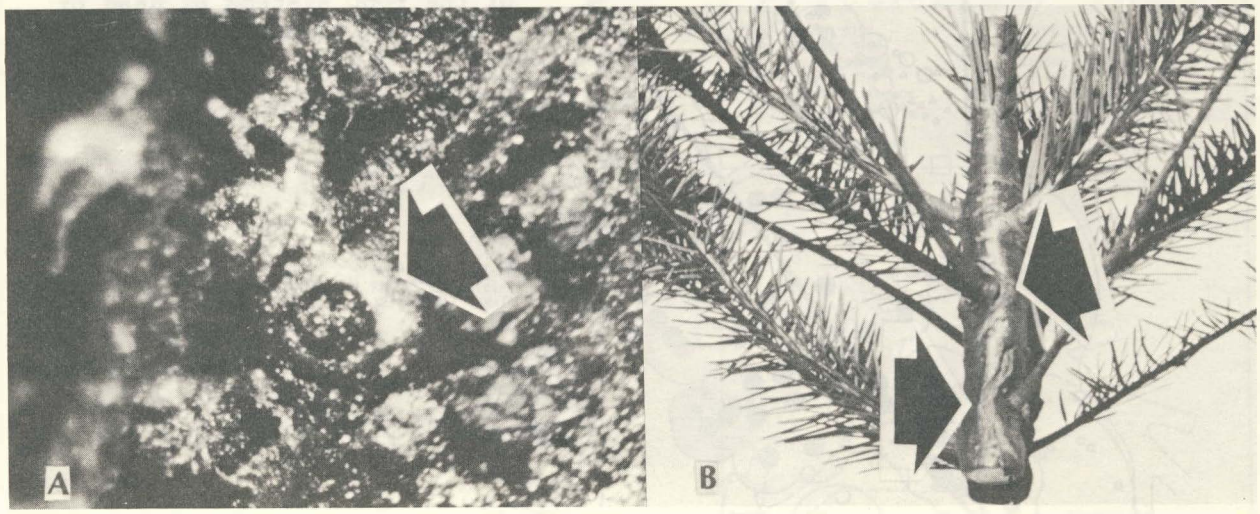
PHLOEM NECROSIS OF DOUGLAS-FIR

Phloem necrosis of Douglas-fir caused by the fungus Dermea pseudotsugae was first found in central British Columbia in 1964. The disease coincided with an unusually severe, early frost and persisted for only one year. Another outbreak occurred in British Columbia in 1971. This time it was associated with winter drying and a spring frost.

The disease was first found in California in 1970 near Happy Camp, Siskiyou County, by D. R. Miller. The outbreak coincided with two years of below-average rainfall and an early light frost. Since this discovery in California, the incidence and severity of this new disease has increased to where it is now considered to be a major canker disease of Douglas-fir in California.

DISTRIBUTION AND DAMAGE. This disease has been reported in British Columbia, Canada and in California, but has never been reported in Oregon or Washington. In California, the disease occurs in the Douglas-fir zone from the Oregon border throughout Del Norte, Siskiyou, Humboldt and Trinity Counties and into northern Mendocino County.

Dermea canker has been found mostly in plantations but it also occurs in natural stands. In some plantations surveyed, 10 to 50 percent of the trees were killed by this disease in three to four years. Although this canker is usually not as severe in natural stands, it has been quite devastating on one such stand just north of Covelo, Mendocino County.



(A) The pycnidia (arrow) are small (0.3-1.0MM) in diameter, circular, partially embedded, black to yellow structures in which the top tears open to reveal a simple cavity bearing a mass of spores (conidia). (B) Stem cankers (arrows) when fresh have characteristic red margins which disappear when the tree dies. The cankers are sunken, and the bark of the main stem around the canker becomes dry and cracked.

* Each year a different California forest disease will be described in enough detail so that field-going personnel can more readily recognize it.

Infection results in both limb dieback and stem cankers of the host. Cankers usually girdle the main stem resulting in top kill. Stem cankers are sometimes invaded by the Douglas-fir engraver beetle, Scolytus unispinosus. In such cases the beetle commonly kills the tree.

DISEASE CYCLE. Conidia (asexual spores) are produced on the infected host from mid to late summer. In early fall, ascospores are produced in these same areas. The ascospores are forcibly discharged and wind-borne to new hosts. Current evidence indicates that most new infections are established in the fall. The fungus spreads through the inner bark killing the phloem and the cambium during the host's dormant season. The result is a sunken reddish canker. Asexual and sexual fruiting bodies are formed in the canker area the following summer and fall. The individual canker remains active for only one year.

FIELD IDENTIFICATION. The most obvious symptoms of this disease are dead tree tops and branches on which the needles have turned red. This red, flagged appearance lasts through the first summer after which the needles fall off, leaving a spiked-top. The stem cankers when fresh have a characteristic red margin which disappears when the tree dies. The cankers are sunken, the phloem and cambium are dead. The bark of main stem cankers often becomes dry and cracked, exposing the dead sapwood.

Stem cankers are sometimes invaded by Douglas-fir engraver beetles, Scolytus unispinosus.

There are two kinds of fruiting bodies which are formed on the dead bark. The pycnidia which appear in late summer are small (0.3-1.0 mm in diameter), circular, partially embedded, black to yellow structures in which the top tears open to reveal a simple cavity bearing a mass of spores (conidia). The ascocarp produced in the fall are raised, black to yellow, saucer-shaped bodies about 1.0-1.5 mm in diameter. They are hard when dry, but fleshy when moist.

CONTROL. At the present time there has been very little research on this disease and there are no known controls. In 1973, pathologists from the Regional Office of the Forest Service will be conducting a survey of the Douglas-fir plantations in northwestern California to determine the damage that can be attributed to this disease.

STATUS AND CONTROL OF ANIMAL PESTS

PORCUPINE. For the second consecutive year porcupines were the number one animal pest problem. Damage caused by these animals was reported as being static to increasing throughout the timbered areas of the State with the greatest amount of damage being done on the central inland forests. Ponderosa, Jeffrey and sugar pine plantations have been severely damaged by porcupines in the Ice House Burn on the Eldorado National Forest, El Dorado County. Damage ranged from moderate to heavy on the northern forests. Again, as has been the case over the last three years, porcupine damage on the Klamath National Forest, Siskiyou County, was quite severe.

Damage to coastal forests has been insignificant in the past, but this year reports indicate the problem is increasing. Control has been conducted in many areas using the standard strychnine salt blocks and hunting. This method was successful in reducing the problem in the Sucker Creek area on the Klamath National Forest. In fact, this is probably the only technique that has met with any success in controlling this problem.

DEER. Browsing of seedlings and saplings of most coniferous species was widespread in the State. Deer browsing has been consistently high in the north coastal areas with serious damage occurring in Humboldt, Siskiyou and Mendocino Counties. This year has not been an exception. Damage ranged from light to moderate on the inland forests and was widely scattered in the southern forests. The rate of deer damage is remaining high and static in most areas. Current research efforts are being directed at repellents and habitat modification. In the past some relief has been obtained with Z.I.P. applications.

POCKET GOPHER. Damage ranging from static to increasing was reported Statewide with the exception of the northern coastal areas. Serious damage was inflicted upon ponderosa pine, Jeffrey pine, white fir and red fir on the inland forests. Increasing damage to plantations on the Eldorado and Sequoia National Forests is a matter of future concern. Use of the Forestland Burrow Builder has rendered the damage static in those areas that are treated on an annual basis. In those areas where control with the machine is not feasible, damage seems to be increasing.

MINOR SPECIES. The species listed below caused minor damage in the counties noted. Although treated here as minor, the damage was severe and heavy in some areas, but it was more localized and not widely scattered.

SPECIES	COUNTIES
1. Beaver	San Bernardino, Tulare
2. Domestic Stock	Mendocino, Inyo, Modoc
3. Duskey-Footed Woodrat	Mendocino
4. Meadow Mouse	Mendocino, San Bernardino
5. Rabbits	Mendocino, Los Angeles
6. Tree Squirrels	San Bernardino, Humboldt

DIRECT SEEDING. No direct seeding projects were reported for the past year.

Neighborhood Youth Corp enrollee, turns the crank on a "gopher gun" to deposit treated grain into a gopher burrow in a plantation on the San Bernardino National Forest.

RESOLUTIONS ADOPTED BY
THE CALIFORNIA PEST CONTROL ACTION COUNCIL
AT ITS ANNUAL MEETING, NOVEMBER 1972

SMOG RESOLUTION

WHEREAS, the high value, high use, pine forests of the Southern California mountains have been dying from photochemical smog for nearly 25 years; and
WHEREAS, on 140,000 acres of moderately to severely damaged forest, pine mortality now amounts to four percent per year; and
WHEREAS, smog is now adversely affecting all other tree species of the mixed-conifer forest; and
WHEREAS, trees weakened by smog are subject to attack and additional mortality by other pests; and
WHEREAS, the smog problem is increasing in Southern California and is appearing in other forested areas in the State, particularly the Western Sierra Nevada; and
WHEREAS, the Forest Service has no long-range detection, evaluation, and research commitments needed to manage smog-affected forests;
NOW THEREFORE, the Council recommends that the Forest Service be funded to establish an adequate, long-range detection, evaluation and research program to develop and apply methods of managing smog-affected western forests, and asks for congressional support for this Forest Service program.

VOTING RIGHTS RESOLUTION

BE IT RESOLVED THAT, voting rights at a full Council meeting will be established by attendance at the Council meeting or a standing committee meeting the previous year, or by attendance at a field meeting of a standing committee the current year, or by application to the membership committee 60 days prior to the full Council meeting. Any right so established will remain valid for two years without further participation.
IT IS FURTHER RESOLVED THAT, the Secretary of the California Forest Pest Action Council shall prepare a list of voting members 30 days prior to the annual meeting of the Council. The Secretary of the standing committees will furnish their list of members to the Council's secretary. The "Committee on Voting" shall be chaired by the Secretary of the Council. Two additional members shall be appointed by the Chairman of the "Committee on Voting."
IT IS FURTHER RESOLVED THAT each member of a standing committee shall vote for officers of only one committee.

FOREST PEST DETECTION REPORT

TWP. ____
RNGE. ____
SEC. ____

COUNTY or FOREST:

DATE:

Location (local drainage or place):

Tree species damaged:

Est. no. trees:

Est. acres involved:

Single trees ☐
Groups ☐
No. in group ____

Reprod. ☐ Poles ☐ Plant. ☐
Saplings ☐ Young saw-timber ☐ Old growth ☐

INSECT ☐
DISEASE ☐
ANIMAL ☐
UNKNOWN ☐

Name of pest (if known):

Part of tree damaged: (circle)
Root Leader Twig Cone
Branch Trunk Bud Foliage

Damage increasing ☐ Damage decreasing ☐ Damage static ☐

Evaluation needed ☐ No evaluation needed ☐

REMARKS, SYMPTOMS, AND CONTRIBUTING FACTORS:

Name and address of reporter:

(Please print, use pencil)

R5-5200-33
Iss. 10-61

FOREST PEST DETECTION REPORT

TWP. ____
RNGE. ____
SEC. ____

COUNTY or FOREST:

DATE:

Location (local drainage or place):

Tree species damaged:

Est. no. trees:

Est. acres involved:

Single trees ☐
Groups ☐
No. in group ____

Reprod. ☐ Poles ☐ Plant. ☐
Saplings ☐ Young saw-timber ☐ Old growth ☐

INSECT ☐
DISEASE ☐
ANIMAL ☐
UNKNOWN ☐

Name of pest (if known):

Part of tree damaged: (circle)
Root Leader Twig Cone
Branch Trunk Bud Foliage

Damage increasing ☐ Damage decreasing ☐ Damage static ☐

Evaluation needed ☐ No evaluation needed ☐

REMARKS, SYMPTOMS, AND CONTRIBUTING FACTORS:

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FOREST PEST DETECTION REPORT

TWP. ____
RNGE. ____
SEC. ____

COUNTY or FOREST:

DATE:

Location (local drainage or place):

Tree species damaged:

Est. no. trees:

Est. acres involved:

Single trees ☐
Groups ☐
No. in group ____

Reprod. ☐ Poles ☐ Plant. ☐
Saplings ☐ Young saw-timber ☐ Old growth ☐

INSECT ☐
DISEASE ☐
ANIMAL ☐
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REMARKS, SYMPTOMS, AND CONTRIBUTING FACTORS:

Name and address of reporter:

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FOREST PEST DETECTION REPORT

TWP. ____
RNGE. ____
SEC. ____

COUNTY or FOREST:

DATE:

Location (local drainage or place):

Tree species damaged:

Est. no. trees:

Est. acres involved:

Single trees ☐
Groups ☐
No. in group ____

Reprod. ☐ Poles ☐ Plant. ☐
Saplings ☐ Young saw-timber ☐ Old growth ☐

INSECT ☐
DISEASE ☐
ANIMAL ☐
UNKNOWN ☐

Name of pest (if known):

Part of tree damaged: (circle)
Root Leader Twig Cone
Branch Trunk Bud Foliage

Damage increasing ☐ Damage decreasing ☐ Damage static ☐

Evaluation needed ☐ No evaluation needed ☐

REMARKS, SYMPTOMS, AND CONTRIBUTING FACTORS:

Name and address of reporter:

(Please print, use pencil)

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FOREST PEST DETECTION REPORT - FACSIMILE SHEET (TEAR OUT)

84172-356 12/72 3600